

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>NSC1P305.WO</b>	<b>FOR FURTHER ACTION</b> see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. <b>PCT/US2005/019560</b>	International filing date (day/month/year) <b>03/06/2005</b>	(Earliest) Priority Date (day/month/year) <b>04/06/2004</b>
Applicant <b>NATIONAL SEMICONDUCTOR CORPORATION</b>		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 7 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed  
☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

- b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☒ **Unity of invention is lacking** (see Box No. III)

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant  
☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant  
☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 3  
☐ as suggested by the applicant  
☐ as selected by this Authority, because the applicant failed to suggest a figure  
☒ as selected by this Authority, because this figure better characterizes the invention
- b. ☐ none of the figures is to be published with the abstract

A. CLASSIFICATION OF SUBJECT MATTER  
 INV. G02B6/12 G02B6/138 G06F3/033

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
 G02B H01S G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 569 181 A (AMERICAN TELEPHONE AND TELEGRAPH COMPANY; AT&T CORP) 10 November 1993 (1993-11-10) figures 1,2,7-10 column 3, line 56 - column 6, line 26 claims -----	1,4,5, 9-13,15, 16,18,21
X	US 6 456 766 B1 (SHAW KEVIN A ET AL) 24 September 2002 (2002-09-24) figures 10,12-15 column 13, line 35 - column 15, line 29	1,4-6
A	idem ----- -/--	13,16, 18,19

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

\* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance  
 "E" earlier document but published on or after the international filing date  
 "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)  
 "O" document referring to an oral disclosure, use, exhibition or other means  
 "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention  
 "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone  
 "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.  
 "Z" document member of the same patent family

Date of the actual completion of the international search

2 November 2005

Date of mailing of the international search report

22.03.2006

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 06, 22 September 2000 (2000-09-22) & JP 2000 078349 A (SHARP CORP), 14 March 2000 (2000-03-14) the whole document -----	1-3,6-9, 12-14, 16,17, 19-21
A	EP 1 271 211 A (FUJITSU LIMITED) 2 January 2003 (2003-01-02)  figures 2,4 paragraph [0033] - paragraph [0047] -----	1,7, 10-13, 15,20,21
A	US 3 832 028 A (KAPRON F,US) 27 August 1974 (1974-08-27) column 1, line 20 - column 5, line 48 figures 1-4 -----	1,13,22
A	US 5 540 612 A (MENDEZ ET AL) 30 July 1996 (1996-07-30) claim 1 -----	8

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No  
PCT/US2005/019560

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0569181	A	10-11-1993	CA 2092840 A1 DE 69311966 D1 DE 69311966 T2 JP 6027355 A KR 179988 B1 US 5332690 A US 5265177 A	09-11-1993 14-08-1997 06-11-1997 04-02-1994 15-05-1999 26-07-1994 23-11-1993
US 6456766	B1	24-09-2002	US 2003019838 A1	30-01-2003
JP 2000078349	A	14-03-2000	NONE	
EP 1271211	A	02-01-2003	JP 2003004960 A US 2002197010 A1	08-01-2003 26-12-2002
US 3832028	A	27-08-1974	CA 998864 A1 DE 2313289 A1	26-10-1976 11-10-1973
US 5540612	A	30-07-1996	NONE	

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2005/019560

## Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-22

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

## 1. claims: 1-22

an apparatus comprising a support substrate with a top surface, a waveguide being formed on top surface of the substrate having a thickness measured in orthogonal direction from the top surface of the substrate and an optical lens integrally formed with the waveguide having maximum lens thickness greater than waveguide thickness and collimating the rays emitted by the waveguide in a plane coplanar to the substrate.

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## 2. claims: 23-29

an optical input device having support substrate with a top surface, bottom cladding layer on the top surface of the substrate, lamina of light over the top surface formed by a plurality of optical structures each comprising a waveguide and an optical lens, each structure formed upon the bottom cladding, each lens having first end connected to the respective waveguide and a second end forming front lens surface, each lens having a raised region between the ends, each lens collimating the rays emitted by the respective waveguide in a plane coplanar to the substrate and an optical position detection device optically coupled with the waveguides and configured to detect data entries.

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**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US2005/019560

**Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)**

Optical transmission structures include a waveguide (102) and an optical lens (104) wherein the optical lens has a sufficiently large thickness to allow the formation of a curved front lens surface (112) that collimates transmitted light rays so that they travel within a plane that is coplanar to a working surface. The present invention also relates to a technique for manufacturing the optical transmission structure, which involves the use of a photopolymer material. The optical transmission structure can be implemented in various systems such as a system for optical data input.